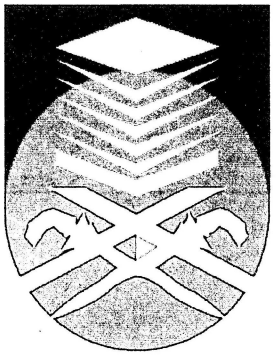

FINITE ELEMENT ANALYSIS OF NITINOL STENT (APPLICATION IN THORACIC AORTA)

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"I declared that this thesis is the result of my own work except the ideas and summaries which I have clarified their source. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of ant degree"

Signed: .....

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ABSTRACT

Stent is a wire mesh tube placed in an artery to support and prevent artery from reclosing. Stent commonly made from Nitinol is well known for its shape memory property. It is widely used in medical application. However, there are several problems related to stent implantation. One of the most common problems is stent migration. The main objective of this project was to propose a new stent design to overcome this problem. This project involved analysis of three different stent design; the generic models and the proposed new design using Finite Element Method (FEM). The applied pressure was 100mmHg on the inner surface of the stent corresponding to the mean value of blood flow rates respectively. It had been found from the simulation that, the value of the maximum and minimum Von Mises stress for design 1 obtained were $1.55x10^4N/m^2$ and $2.92x10^3N/m^2$ respectively. For second stent design, maximum and minimum Von Mises stress value obtains were $1.30x10^4N/m^2$ and $3.70x10^3N/m^2$ respectively. For proposed new stent design, maximum value Von Mises stress obtained was $1.52x10^4N/m^2$ while minimum Von Mises stress obtained was $3.94x10^3N/m^2$.

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